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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,352	02/13/2006	Jang-Kun Song	8071-148T (OPP043105US)	5683
22150 7590 09/05/2008 F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797				
EXAMINER				
HOLTON, STEVEN E				
ART UNIT		PAPER NUMBER		
2629				
MAIL DATE		DELIVERY MODE		
09/05/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/520,352

**Applicant(s)**

SONG ET AL.

**Examiner**

Steven E. Holton

**Art Unit**

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 7 is objected to because of the following informalities: the acronym OCB should be spelled out within the claim to avoid confusion of the meaning of the term. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claims 8 and 11, the terms "first direction" and "second direction" are unclear. The disclosure provides teaching that the first direction and second direction are intended to indicate first and second scanning directions. The lack of reference to scanning direction in claims 8 and 11 is indefinite. Specifically, what method of applying data has a first and second direction? This could be applied to either a scanning direction (top to bottom/bottom to top) of a data loading direction (left to right/right to left), or a combination of the two. Thus, it is unclear and indefinite the meaning of the terms 'first direction' and 'second direction' without reading information from the specification into the claims. The Examiner recommends changing the terms

to 'first scanning direction' and 'second scanning direction' to better clarify the terms.

Dependent claims 9, 10, and 12 inherit this problem from their parent claims.

Regarding independent claim 3, the steps of the method described in the claim are unclear and indefinite. The Examiner believes that claim 3 is intended to claim the method described in the specification with regard to Figs. 6-9. However, the claims fail to clearly explain the driving method described within the specification. The phrase "the normal data signals and the black data signal are alternately applied to each scanning area" is unclear because it does not explain how each scanning area has the normal and black data signals are applied. Are they applied normal then black for a single area and then normal and black for a second area and continuing for all areas? Are odd areas provided with normal data and even areas receive black data and then the roles are reversed? Are all areas provided normal data and then all areas are provided with black data? Further, the steps of "the normal data signals are applied to one of the scanning areas, and then the black data signal is applied to one of remaining scanning areas except for the one of the scanning areas" and "scanning of the scanning areas for a previous frame is completed, and then scanning directions within the scanning areas for a next frame are opposite to scanning directions of the previous frame" are similarly unclear about the operation of the display device. After normal data is applied to a first area and black data is applied to another area, is black data applied to the first scanning area? Is normal data applied to the another scanning area? Is there a specific method of selecting the another scanning area? How are all of the scanning areas scanned with previous frame data? The described method only appears to scan a single area

with data and then another area with black data. Dependent claims 4-7 inherit the rejection from their parent claim.

Regarding independent claim 11, the Examiner believes that this claim is intended to claim the method described in the specification with regard to Figs. 6-9, but fails to clearly describe a method of operation for a display device. Specifically, the repeated steps do not clearly explain the sequence of operation and selection of display areas on the display device. The first three steps select a first area and apply image data to the area, then black data is applied to a second area, and then image data is applied to the second area. The repetition step states that the first three steps are then applied to the plurality of areas on the display. It is unclear if that means on repetition a third area (not previously selected) is now a new first area or if the previous second area is now selected as a new first area. It would be unclear how a previous second area becomes a new first area because image data would be applied to the same area twice in succession. Also, no black data appears to be applied to the first area selected for the display, black data is only applied to 'second areas' of the method. This is clearly different than the described method in the specification and causes the claim to be more unclear and indefinite. Dependent claim 12 inherits this rejection from its parent claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 8, 9, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizutani et al. (USPN: 6392620), hereinafter Mizutani.

Regarding claim 13, Mizutani discloses a liquid crystal display device (Fig. 2, element C) that includes a plurality of pixels (Fig. 2, elements 5, 6, 7, and 1b form individual pixels). Mizutani further discloses driving the display device with normal signals and black signals and alternately applying the normal and black signals to the display over time (Figs. 3A and 3B; col. 3, line 50 - col. 4, line 6). Because the time periods for the image signals and black signals are held constant (Figs. 3A and 3B) the average time over adjacent frames of the normal data is inherently uniform.

Regarding claim 8, Mizutani discloses driving a display device by first applying data voltage to pixels in a first direction (top to bottom) (Figs 3A and 3B; the periods of R, G, and B, within a single frame; col. 7, lines 13-43). Then Mizutani applies black data voltage to the pixels (Figs. 3A and 3B; the BL period of the frame). Then in a second frame period Mizutani applies further data voltages to the display in a second direction

(top to bottom) and finally applies black voltages to the display pixels (Figs. 3A and 3B, the actions in Frame 2).

Regarding claim 9, Mizutani discloses applying normal data voltages with opposite polarity for each successive frame (Fig. 9, the "pixel electrode potential" element 1b line shows a set of positive voltages in period F11 and a set of negative voltages in period F21). The Examiner notes that this driving technique is commonly known as 'frame inversion'.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani.

Regarding claim 10, the black voltage data applied by Mizutani is typically a zero voltage signal (Fig. 9, the data applied during period F12 and F22 results in zero voltage applied to the display device). However, if the black voltage did provide a specific polarity to the display (in the case of a normally white display where a black image requires an applied voltage), it would have been obvious to one of ordinary skill in the art that the polarity of successive black image data could be inverted from one frame to the next frame. This technique is known as 'frame inversion' and is well understood

within the art. Mizutani shows the use of frame inversion with regard to the display data applied during the normal periods, F11 and F21, shown in Fig. 9. It would have been obvious to one of ordinary skill in the art that the polarity of any black data voltages could also be inverted for each successive frame using the same inversion technique used by Mizutani during the normal data voltage period.

5. Claims 1, 6, 7, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani in view of Surguy (USPN: 5233338).

Regarding claim 1, Mizutani discloses a liquid crystal display device (Fig. 2, element C) with a plurality of pixels in a matrix (Fig. 2, elements 5, 6, 7, and 1b form different pixels in a matrix), a gate driver (Fig. 2, element 12), a data driver (Fig. 2, element 13), and a signal controller for providing control and gray signals to the drivers (Fig. 2, element 23). Mizutani further discloses the data signals include normal data signals and black data signals and applies the two signals alternately to the pixels (Figs. 3A and 3B; col. 3, line 50 - col. 4, line 6).

However, Mizutani does not disclose reversing the scanning direction of the display from one frame to another frame.

Surguy discloses a liquid crystal display device that reverses the scanning direction of the display for each frame (Fig. 4).

At the time of invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Mizutani and Surguy to produce a liquid crystal display device that inserts black data after normal data for each frame and reverses the



scanning direction of the display for each frame. The motivation would have been to increase the amount of lamp illumination time during driving of the normal display data and improving the brightness of the display (Surguy, col. 1, lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art that the scanning direction of the display device of Mizutani could be reversed after each frame using the teachings of Surguy to produce a device as described in claim 1.

Regarding claim 6, Mizutani discloses the polarity of the data signals for adjacent frames is opposite (Fig. 9, the "pixel electrode potential" element 1b line shows a set of positive voltages in period F11 and a set of negative voltages in period F21).

Regarding claim 7, neither Mizutani nor Surguy disclose the liquid crystal display is in an OCB mode. It would have been a matter of design choice for one of ordinary skill in the art to use a liquid crystal display device in either an OCB or other type of known configuration. The selection of the type of configuration would depend on desired driving and response speed of the display device, cost of manufacturing and other known differences between types of liquid crystal display devices.

Regarding claims 12 and 14, Surguy discloses reversing the scanning direction of a display for each frame. It would have been obvious to combine the teachings of Surguy and Mizutani to disclose a display device that displayed normal image data and black image data and reversed the scanning direction for each frame.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani in view of Surguy as applied to claim 1 above, and further in view of Kwon (USPN: 6947034).

Regarding claim 2, the combination of Mizutani and Surguy disclose all of the limitations except, "the black data signal is simultaneously applied to the pixels."

Kwon discloses a method of driving a liquid crystal display device so that image data is first applied to the pixels and then black image data is applied to the pixels (Figs. 4 and 6). Kwon further discloses that the black data voltages (called adjust voltages) can be simultaneously applied to multiple gate lines at the same time (claim 8).

At the time of invention it would have been obvious to one of ordinary skill in the art to modify the teachings of Mizutani and Surguy with the teachings of Kwon. It would have been obvious that the black image data applied by Mizutani could be modified so that instead of applying the black data to each line in succession, the black data could be applied to multiple or all of the lines simultaneously as described by Kwon. This would have been a matter of design choice for applying the black signal in series or simultaneously depending on the desired amount of time used for a single frame period. Thus, it would have been obvious to combine the teachings of Mizutani, Surguy, and Kwon to produce a device as described in claim 2.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Son et al. (USPN: 6693618) discloses methods of driving a display including displaying normal image data and then black image data and providing a moving black image area when displaying image data in other regions of the display device. Arimoto et al. (USPgPub: 2003/0090449) discloses a liquid crystal display device with normal image data and black image data and inversion of the polarity of image data applied to the display. Miwa et al. (USPN: 6396469) discloses another impulse driven liquid crystal display device. Nose et al. (USPgPub: 2001/0003448) discloses another impulse driven liquid crystal display device including polarity inversion. Kitagawa (USPN: 5844539) discloses a liquid crystal display device that simultaneously drives multiple display lines at the same time to apply a black data signal to all lines at the same time.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571)272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven E. Holton  
Division 2629  
September 1, 2008  
/Bipin Shalwala/  
Supervisory Patent Examiner, Art Unit 2629